

9 July 1965

MEMO FOR RECORD (FILE: R&D 20-0-2C)

Subject: Customer Requirements for Annotated Data

1. On this date, we met with two men of the Customer's Office to discuss the Code Matrix Block (CMB) of MIL-STD-782A, "Tactical Reconnaissance Data Marking", as it applies to our system. The meeting was quite fruitful and produced some information useful to us.

2. Although the visitors felt that the Standard data would be very helpful, they had thoughts on those items of data which would be more helpful to them. It is good that most of the items they feel to be desirable are already available somewhere within the air vehicle or the sensors, which means that we might be able to satisfy their requirements with only small additional effort.

3. As a result of specific questions posed to the visitors; we learned these facts:

a. Storage and retrieval: The Customer does not presently use film chips for storage of intelligence film, nor is there expectation that film chips will come into use within the next several years. At present the storage of original negative (ON) material is in rolls with average length of 250' and it is likely that the ON's from our vehicle will be stored similarly.

c. Reading Sense: The Customer has no specific requirement for the reading sense of the CMB relative to the photographic image; however, he feels (as we do) that the CMB should right-reading with the film image. This will be a help in cases where a photo interpreter simply eyeballs the film since he will then be able to read both the image and the CMB directly -- there will be no need to twist the film to properly orient one with the other.

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d. Present Data: The Customer feels that certain items of data presently in the cameras and other sensors may be retained, and that some may or should be removed. To be retained should be the frame counters, sensor serial numbers, lens serial numbers, and CFL numbers, where they exist, while the clocks, the write-in data cards, and other items of data not mentioned should be removed.

e. Additional Data: The Customer feels, again as we do, that the CMB should include some additional items for information not presently readily available in the air vehicle or the sensors: pointing angle indication, frame count indication, V/H ratio, cage indication, and operating mode (these are covered in more detail below).

STATINTL 4. The [] is the only camera, and the SLR is the only other sensor, STATINTL to which the "pointing angle" requirement applies. This means that the [] installation will require to have an encoding device incorporated to permit generation of a binary indication of the pointing angle at which the camera oblique head is positioned. The accuracy of the pointing angle need not be finer than 1/2 degree, and the presentation should be three digits.

5. The SLR uses "pointing angle" in a manner similar to the [] however, STATINTL the true function is one of slant range rather than angle. In this case, the SLR will be required to generate a signal which will present the slant range as a two-digit figure.

6. The frame count appears to be an important item of information for the Customer, especially since the ON is filed in complete rolls, for the number forms part of the accession number, with the balance being the sortie number and date. As noted above, the Customer suggests that the analog presentation of frame count be retained where it already exists: if this is done, then the binary frame count indication must be matched to the analog presentation, to preclude confusion in reading. It remains to be seen what the final disposition of the analog frame count mechanism will be; however, the requirement for binary presentation of frame count is firm.

7. A third item which is quite desirable, and which is useful to the Customer, is an indication of the true V/H ratio. This item can be presented as a two-digit number, to represent the value in milliradians, and would be the ratio computed by the ANS without regard to the signal source actually in use for the V/H command to the sensors.

8. Two items which should go into the optional spaces of the CMB are "Cage Indication" and "Operating Mode". The cage indicator would be useful in cases where the vehicle maneuvers cause the sensor to operate against the stops. The presentation would be one-digit indication of the "go-no-go" type. The operating mode would be applicable to those sensors in which more than one mode of operation was selectable, for example:

- a. TROC: 55% overlap or 10% overlap.
- b. OOC: No mode selection is available.
- c. Mode 1, Mode 2, or Mode 3.
- d.
- e. SLR: As applicable.

The signal for this indication could be generated externally to the sensor and inserted at the appropriate place in the CMB.

9. One final item of "new" data is that of the "Sensor Identity". There has been some discussion of the usefulness of this item of information and the manner in which it should be presented. The Standard specifies three characters for the presentation, which apparently presupposes a universal coding system. The Customer will look into the subject further, for he has several other systems in which the CMB is used, and it appears that he would be the most logical assignor of codes to be used.

10. The Standard is quite specific on the matter of positioning of the CMB relative to the frame of photography, the reason being to assure compatibility with the automatic reading devices. If the needs of this Customer are to be the criterion, then we can assume much greater flexibility in the positioning of the CMB recording head, for the Customer currently has under development an automatic reader which is quite versatile. The reading head can be positioned anywhere within an envelope with a 9 inch travel across the film, and a 5 inch travel along the film, both of which should accommodate the positioning which will probably be dictated by existing configurations of our sensors. A very important facet of the Customer's operation is the manner in which the automatic reader is used; the Standard presupposes that a reader is used for search or for some other purpose which requires the CMB to be at the leading edge of the frame of photography; the Customer is unconcerned with the relative position of the CMB since the proper sequential position is all that is required. The CMB is used primarily to present information through the reader onto a magnetic tape for ultimate computer use. All in all, then, it appears that we have had a severe constraint removed from the installation requirements for the recording head.

11. Speaking of tapes, the Customer made a point which is not germane to the problem at hand, but it will require action at some time. The Customer has use for the mission recording tapes (or extracted portions of the tapes) for use in evaluation of the imagery. The evaluation is made only when the imagery is less than specification quality, or when serious degradation is present. In those instances when the imagery is completely acceptable, the mission recorder tape is not used; the decision lies with the Customer, though, so the tape must be supplied.

12. In summary, we now have sufficient information on which to take a stand for the format to be imprinted on the several sensor films. The first attachment presents, in tabular form, those items of information which are suggested and desired by the Customer, with indications of which are already available and those which must yet be made available. The second attachment depicts a recommended arrangement for the several items which must appear within the CMB. It may be noted that maximum usage is made of the spaces which already exist, and which are for optional use. Only one item is recommended for withdrawal from the CMB, and that is the "Detachment and Squadron", for it was the joint opinion of the Customer and of the SPO that this item is probably the least important of all on the format.

LARRY R.

- 2 Atch
- 1. Data Tabulation
- 2. CMB Format

25X1D

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DATA TO BE ANNOTATED (Continued)

- NOTES:
1. For cameras only
 2. On Technical Objective Camera only
 3. Not a specific indication; shown as a function of the format of the imagery, of the presence or absence of imagery
 4. For radar only
 5. Identified through track usage only
 6. Appears on Accutron clock
 7. Appears on write-in cards on cameras; as separate items of data on tape and on CMB
 8. Desirable, but not essential, for it can be reconstructed from other data
 9. New item of data; discussed in basic Memo

The data requirements as shown in the above tabulation relate only to those aspects discussed during the meeting of 9 July; the items not discussed, but which are to be retained as items of data, are depicted in the Attachment on CMB format.

Atch 1-2

CODED DATA MATRIX BLOCK

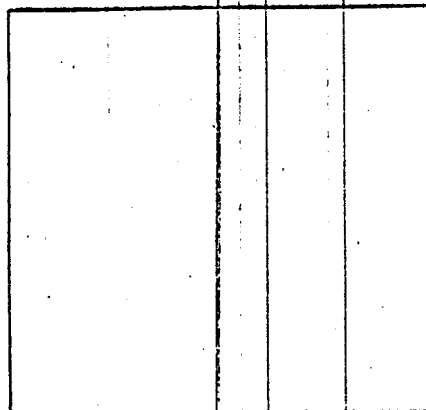
[illegible]

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SR-71

NOTE: Ground "paint"
shown to same
approximate scale
for all sensors

Altitude: 85,000'



F-489
Terrain Objective

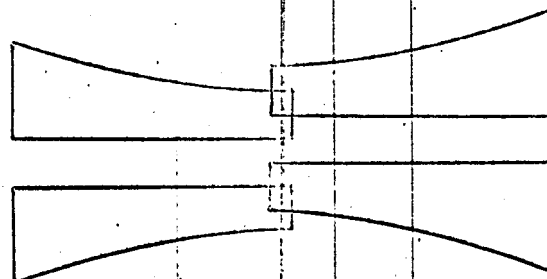
Lateral: 21 NM
Line of flight: 21 NM
Forward Overlap: 10%
55%

9085
Operational Objective

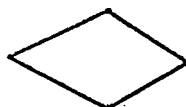
Lateral: 13 NM
Line of flight:
Track: 2.4 NM
Edge: 3.4 NM
Forward Overlap: 10%

Mirror forward 3.75°

Mirror aft 3.75°



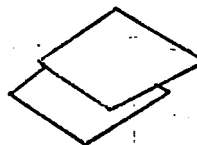
Mode 1: 0°-45°
Mode 2: 0°-45°
Continuously and
infinitely adjustable



HR-308A
Technical Objective

Lateral:
Vertical: 2.6 NM
45°: 7.5 NM
Line of flight:
Vertical: 2.6 NM
45°: 5.3 NM
Forward Overlap:
Mode 1: 90%
Mode 2: 55%
Mode 3: 55%

Mode 3: 4° to 41°
Illustration shows left
camera at 4° setting and
right camera at 41° setting



CAMERA GROUND "PAINT"
Figure 6-14